Case Report

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Multiple Organ Failure Due to Fungal Intoxication; Case Report

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Abstract

A 35-year-old female patient was admitted to our hospital with organ failure due to excessive consumption of wild mushrooms. She had a medical history of previous tuberculosis and, in accordance with it, a destructed lung. Hepatorenal syndrome and encephalopathy clinics were established. The patient's clinical findings related to fungal intoxication declined with penicillin G and supportive fluid electrolyte treatment, however, the patient died from ARDS due to her destructed lung. Fungal intoxication may be asymptomatic throughout the incubation period. Health care professionals should consider that fungal intoxication may also occur in patients admitted with asymptomatic symptoms due to seasonal conditions and nutritional habits.

Keywords: fungus, intoxication, multiple organ failure

Özet

35 yaşında kadın hasta, yabani mantar tüketimi sonrası organ yetmezliği ile hastanemize başvurdu. Tıbbi özgeçmişinde, tüberkülozun ve buna bağlı destrüktif akciğer hastalığı hikâyesi vardı. Hastada hepatorenal sendrom ve ensefalopati'yle ilişkili klinik bulgular mevcuttu. Hastanın mantar intoksikasyonu ile ilgili klinik bulguları penisilin G ve destekleyici sıvı elektrolit tedavisi ile azaldı, ancak hasta dekstrüktif akciğere bağlı gelişen ARDS nedeniyle hayatını kaybetti. Mantar zehirlenmesi inkübasyon süresi boyunca asemptomatik olabilir. Sağlık profosyonelleri, mevsimsel koşullar ve beslenme alışkanlıkları nedeniyle riskli hastalarda asemptomatik olsalar bile mantar zehirlenmesini düşünmelidir.

Anahtar Kelimeler: mantar, zehirlenme, multipl organ yetmezliği

Introduction

Turkey, with its suitable ecological conditions, is a country rich in diversity of fungal species. Mushroom is a protein-rich food source. Especially in spring and autumn, mushrooms cultivate more after periods of ample precipitation and poisoning cases are more common in these periods. In areas with low socio-economic conditions, it is also common to consume mushrooms after gathering from their habitat[1,2].

It is known that there are approximately 5000 fungus species around the world and only 200-300 are safe for consumption. Among the known, 100 fungus species are found to be toxic and 10 species to be lethal. It is not known whether other fungus species are edible or poisonous[3].

Mushroom species in our country are consumed very often for nutrition purposes. We aimed to present a patient who was poisoned as a result of consuming the mushrooms collected from the environment with repeated meals every day for natural nutrition. This patient also developed multiple organ failure due to late diagnosis.

Case Report

A 35-year-old female patient applied to an external center because of abdominal pain, nausea and vomiting that started three days ago; but afterwards, the patient was admitted to our hospital with deterioration of general condition, confusion and the development of acute renal failure. In her history, it was learned that her complaints started one week before she was admitted to the hospital and that she ate mushrooms she collected from the environment every day for about fifteen days. She had a history of tuberculosis 4 years ago. She had respiratory distress when she was admitted. Because of mixed

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acidosis in the arterial blood gas analysis (ABG) and high liver enzymes in the biochemical analysis; the patient was transferred to the general intensive care unit (ICU). Her general condition was bad and she had confusion, tachypnea, dyspnea, hypotension and low sPO_2 (78%). Physical examination with oscultation revealed bilateral rhonchus in the lung zones. Because of the destructed lung tissue detected in computed tomography (CT) image due to previous tuberculosis, non-invasive mechanical ventilation support was initiated, since it was thought that there might be extubation difficulties. However, with her advanced confusion (GCS: 8) the patient underwent orotracheal intubation and mechanical ventilation.On arrival, her workup results were as following: AKG pH:6,94, PO2: 70,6mmHg, PCO2:81,8mmHg, HCO3:17,8, BE:-15,7, Lactate:9,2, SO2:78,8%, INR 3,20, PT: 34,9sec, urinary hematuric, D-Dimer :11400, WBC on hemogram:21,8 10^3mm^3, Hb:12,5 g /dl, PLT:238,10^3mm^3, CRP:3,28 mg /dl, BUN:77mg / dl, Creatinine: 1,08mg /dl, ALT:1401U /L, AST:2600 U /L, Alb:2,9 g / dl. According to the results and the story, the patient was thought to have multiple organ failure due to fungal poisoning. Penicillin G infusion was initiated with 1 million units/hour/24 hours with supportive therapy in the ICU. Gastric lavage and bowel decontamination were not performed due to late period.During the treatment process, patient's liver and kidney failures and encephalopathy were improved and her consciousness was recovered. Respiratory support was continued in this process.Weaning from mechanical ventilation was applied.The patient was extubated on the seventh day of intubation. However, one day after the extubation, the patient was re-intubated because of the destructed lung. The patient, who could not meet the extubation criteria during the next intensive care unit period, died due to ARDS on the 21st day of hospitalization.

Discussion

Fungal intoxication is caused by the oral administration of many different toxic substances[4]. Consumption of uncultivated wild mushroom species instead of known edible mushroom species as a consequence of physical similarity plays a major role in toxicity. In addition, it has been reported that toxicity develops as a result of consciously ingestion for psychoactive effects, use for suicide or murder purposes and accidental ingestion, especially in pediatric patients[2,3].

Toxicity occurs with various clinical findings depending on the species being consumed, the amount of consumption, the season the mushroom is being consumed, the geographical location of the mushroom, the cooking method and the individual's response[2]. Amanita species (Amanita phalloides) are responsible for 90-95% of the fungal intoxications associated with death. Amatoxins (900 dalton proteins) are primarily alpha and beta groups, thermostable and dialyzable octapeptides and bind to the 140 kd sub-unit of RNA polymerase II, in order to compete for mRNA synthesis. These toxins are highly potent and are lethal at a dose of 0, 1-0,3 mg/kg. Amatoxins are resistant to cooking and freezing.Toxins can cause poisoning even when frozen[1].

The early diagnosis of Amanita phalloides intoxication is very important, but usually atypical onset symptoms lead to skipped cases[5]. Intoxication may be asymptomatic throughout the incubation period. Afterwards, gastrointestinal symptoms such as nausea, vomiting, abdominal pain, diarrhea and, in accordance with these, severe dehydration may develop.

Liver is the target organ for Amanita phalloides intoxication; acute liver failure occurs with a sudden increase in aminotransferase and bilirubin. Hepatic coma, coagulation disorders and renal failure occur with hepatic failure. The central nervous system is also affected by toxicity and changes in consciousness develop[5, 6]. Renal failure in patients depend on the toxic effect of hepatorenal syndrome and alpha-amanitis direct effect on the kidneys[1]. In general, gastroenteritis and central nerve system findings are temporary. Liver failure can be fatal with the need for transplantation. These clinical pictures were also formed in our patient.

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In our case, asymptomatic gastrointestinal system findings were the first reason for admission and toxicity was overlooked, because the complete history could not be obtained. On the third day of admission to the external center, the patient was admitted to our hospital with multiple organ failure.Since asymptomatic fungal intoxication cases were very common in our hospital and the patient had encephalopathy due to liver failure, history of fungal ingestion was included in the questioning of the history and the family transferred the information after interrogation.

In treatment, stabilization of vital signs is the main objective; firstly, intestinal decontamination, and activated charcoal and intravenous fluid treatments are applied to prevent amatoxin absorption. To our patient, gastric lavage and activated charcoal were not applied because of the late period. Diuresis and biliary drainage were injured for toxin elimination. As supportive treatment, plasmapheresis, Molecular Adsorbent Recirculating System (MARS)[7] and fractionated plasma separation and absorption (FPSA)[8] can be considered to be administered in the first 36-48 hours after ingestion. However, clinical data are limited on this regard. In addition, diuresis and biliary drainage can increase the elimination of amatoxins and provide sufficient therapeutic effect[5]. Since our patient had renal failure, appropriate fluid treatment was initiated.

Controversial results with regard to the therapeutic efficacy associated with potential antidotes, including benzylpenicillin, N-acetylcysteine and silymarin, are available in publications. These antidotes are known to provide some degree of success and are recommended for use by some

national poison centers.To our patient, we applied penicillin G infusion, despite being in the late period[5].

In addition, polimoxin B antidotes and traditional Chinese medicine glossy Ganoderma decoction (GGD) are considered novel therapeutic agents that promise to prevent toxin-induced liver damage[5].

Liver transplantation is accepted as the only approach to increase survival rate in fulminant liver failure due to fungal intoxication[9].

Conclusion

Despite successful treatment with hepatorenal syndrome and encephalopathy due to fungal intoxication, the patient died due to the existing destructive lung.Health care professionals should consider that fungal intoxication may be present in patients applying with asymptomatic symptoms depending on seasonal conditions and nutritional habits. This may allow the table to be resolved without aggravation.

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